United States Department of the Interior

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TAKE PRIDE IN AMERICA

Memorandum

To: Deputy Associate Director for Valuation and Audit

From: Chief, Royalty Valuation and Standards Division [Original signed by Carmen K. Diel]

Subject: Kauley Settlement Agreement (Agreement)

In December 1991, the subject Agreement was accepted by the Federal District Court for the Western District of Oklahoma. Under the Agreement, the Royalty Management Program committed to undertake certain actions related to royalty accounting for Indian allottees who own an interest in oil and gas leases on lands located within the Anadarko Area. Items 18 and 19 of the Agreement pertained to the determination of estimated majority prices to be considered in the valuation of natural gas for royalty purposes. The attached report details work performed by the Royalty Valuation and Standards Division (RVSD) to calculate the estimated majority prices envisioned by the Agreement.

The Agreement provided for the calculation of estimated majority prices beginning with the production month January 1986. Six different methodologies were agreed upon to calculate estimated majority prices. The methodologies varied depending on the detail of information maintained by the State of Oklahoma that was to be used for computation purposes. Upon completion of the processing and analysis of the Oklahoma data, we concluded that Method 6 is the best estimator of a median value upon which to establish a minimum royalty value in the Anadarko Area. Method 6 provides for the aggregation of all available gas sales data for a given field and month in calculation of the median value.

The RVSD is proceeding on the basis that Method 6 will be acceptable and has begun to identify discrepancies between these estimated median values and the royalty values reported to Minerals Management Service for the Anadarko Area leases, beginning with the January 1986 production month. We anticipate completing the comparison of reported royalty values to calculated median values by the first week in June.

Attachment

MAJOR PORTION ANALYSES REPORT
ANADARKO AREA LEASES

Purpose

The purpose of this report is to provide a background and discuss the results of a major portion analyses study concerning gas production from allotted Indian leases in the Anadarko Area of Oklahoma recently undertaken the Royalty Valuation and Standards Division (RVSD) of the Royalty Management Program of the Minerals Management Service (MMS).

Background

The Department of the Interior has been involved in litigation concerning the allotted Indian leases issued by the Bureau of Indian Affair's (BIA) Anadarko Area Office. This case is referred to as the Kauley litigation. One issue addressed in the Kauley litigation settlement is the determination of natural gas values for royalty purposes with consideration of the highest price paid for a majority of like-quality gas in the same field (major portion analyses). This issue is specifically addressed in Item Numbers 18 and 19 of the settlement wherein the parties agree to the following major portion methodology:

a. For each field or area by Natural Gas Policy Act (NGPA) category MMS will determine the statistical best estimates of majority price using the best available data. For each NGPA category, and each month, this value will constitute the minimum royalty value for gas production.

b. Where data on NGPA categories is insufficient to determine separate estimated majority prices for each category, data will be aggregated and a single estimated majority price will be established.

c. Value will be the higher of the single estimated majority price (to the extent it does not exceed the maximum lawful price for any gas production under the NGPA), or gross proceeds accruing to the lessee.

d. Where sufficient data do not exist to establish majority prices, under either methodology established in "a" or "b" above, value will be calculated according to the applicable gas valuation rules, without regard to the major portion analyses.

e. Calculated minimum values will be communicated to payors with the directive to recalculate and submit any additional royalties and late payment charges.

f. This methodology will be applied to the plaintiff class leases, within the current audit strategy, using data from the Oklahoma Tax Commission. Values derived by this methodology will also be compared to all values reported to MMS from January 1986 to the date of settlement.

Major Portion Methodology

Regulations governing the royalty valuation of natural gas require a majority price to be determined by summing individual sales volumes, listed in descending price order, of a particular quality of gas in a given field. The price associated with the volume that causes the cumulative volume, summed beginning with the volume associated with the highest price (lowest price beginning March 1, 1988), to exceed 50 percent of the total sales volume is deemed to be the majority price. Like quality gas has been defined by MMS as gas of similar physical, chemical, and legal (Natural Gas Policy Act (NGPA) category) characteristics. Sales prices are prices per Mcf at 14.73 psia and 60° F and based upon 1,000 Btu/cu. ft.. Reimbursements for severance taxes and/or production related costs are not included when calculating majority prices. Under the settlement agreement, gas sales data from the Oklahoma Tax Commission (Commission) will be used to perform the major portion analyses described above. Previous analyses of the Commission data indicated that NGPA categories and Btu content were not available with any consistent reliability. Therefore, the settlement agreement stipulated that if the data needed to perform the analyses at that level of detail is insufficient, the data will be aggregated and a single majority price will be established.

Because the method to aggregate data was not specified in the settlement

agreement and because different aggregations could yield a majority price using a methodology closer to the "ideal" methodology prescribed under the regulations, RVSD created 6 different data sets from which majority prices were calculated. Each data set is described below and are identified throughout the report as calculation methods.

Calculation Method 1

Calculation method 1 utilizes all records that have a valid NGPA category and also have a reported Btu content. Values are adjusted to reflect a Btu content of 1,000 Btu/cu. ft. and majority prices are calculated in $/MMBtu by NGPA category. This calculation method is the same as required by the valuation regulations.

Calculation Method 2

Calculation method 2 utilizes all records with a reported NGPA category regardless if the Btu content was reported. Majority prices are calculated in $/Mcf by NGPA category.

Calculation Method 3

Calculation method 3 utilizes all records with an invalid NGPA category and a valid Btu content and then eliminates all values below the spot market price for the Anadarko Basin. Majority prices are calculated in $/MMBtu.

Calculation Method 4

Calculation method 4 utilizes all records without a NGPA category designation regardless if the Btu content was reported and calculates a majority price in $/Mcf. This method also eliminates all values below the spot market price.

Calculation Method 5

Calculation method 5 use all records with a valid Btu content and calculates majority prices in $/MMBtu. This data set equals the records used in method 1 plus records used in method 3.

Calculation Method 6

Calculation method 6 uses all records and calculates majority prices in $/Mcf.

Calculation methods 1 and 2 calculate a majority price by month and by NGPA category for each field. Calculation methods 3, 4, 5, and 6 only provide one majority price for each field in a month.

Data Collection

Once the methods of aggregating the data and calculating the majority prices were established, RVSD requested the necessary gas sales information from the Commission as reported to them on the Gross Production Monthly Tax Report, Report ID: OTC 300-R-7-81, resulting in the receipt of over 3,000,000 individual gas sales records. The RVSD next obtained a list of leases from the MMS's Auditing and Financial System database that had a fund code corresponding to leases issued by the BIA Anadarko Area Office. The Oklahoma field descriptions, as defined by the Oklahoma-Kansas Nomenclature Committee, were then researched to determine the fields in which each of the leases were located. The list of leases and the corresponding fields are provided on Table 1. The gas sales information pertaining to the fields containing Anadarko Area leases was then extracted from the Commission data. Due to a variety of reasons, not all of the fields containing Anadarko Area leases had associated gas sales data from the Commission. Table 2 provides a list of fields and the number of leases in each field and whether data was received from the Commission. As can be seen by Table 2, data was received on only 62% of the 160 fields, but the number of leases in these fields represented 88% of the total leases (1,367).

Majority Price Calculations

RVSD next created the 6 different data sets and proceeded to perform the 6 different major portion analyses. Table 3 provides the statistics for each of the calculation methods including the volume of gas and the number of records used in each method and the number of majority prices calculated. Although 3,000,000 records were provided by the Commission, only 667,000 records were found in fields containing the Anadarko Area leases. The percentages provided on Table 3 were calculated on the assumption that calculation method 6 represents 100 percent of the total volume and records. Upon calculation of over 42,000 majority prices, RVSD was now able to analyze the majority prices to determine which calculation method yielded the most reasonable values.

Evaluation of the Majority Prices

In order to determine which calculation method consistently yielded the most reasonable value for royalty purposes, RVSD performed many different evaluations. These evaluations attempted to determine if a calculation method yielded reasonable majority prices and if a representative volume of gas was used in the calculation. Because manpower restraints made it impossible to review and analyze each of the over 42,000 majority prices calculated during the study, an average majority price by calculation method and month was calculated. This "average" majority price is considered to be representative of the calculation method and month combination and references to a majority price in the following discussion of the different evaluation procedures refer to this "average" majority price.

Effects of Btu Content on the Majority Price

The first analysis was to determine the effect of adjusting the prices for Btu content, as done in calculation methods 1, 3, and 5, as compared to calculating a price per Mcf without adjustment for Btu content as done in methods 2, 4, and 6. Figures 1 and 2 plot the average majority prices by month for calculation methods 3 and 4 (Figure 1) and methods 5 and 6 (Figure 2) and show that the prices are very similar. Because of this similarity, it can be assumed that the quality of the gas used in methods 3 and 5 was very close to 1,000 Btu/cu. ft.. The similarity also leads RVSD to conclude that

adjusting the prices to a $/MMBtu basis has little effect on the majority price. Based on this conclusion, calculation methods 3 and 5 were eliminated from the study because they had similar prices to calculation methods 4 and 6 and used considerably less volumes in the calculations (see Table 3).

A similar analysis on the effect of the Btu content was performed on calculation methods 1 and 2 and again showed corresponding values. In comparing calculation methods 1 and 2, the volumes were much closer to each other than in the other Btu vs. Mcf calculation methods (Table 3). Based on this fact, it appears that those parties that reported a valid NGPA category also reported a valid Btu content. Because of the comparable values and volumes in calculation methods 1 and 2, and because calculation method 1 uses data as prescribed by the regulations, calculation method 2 was eliminated from consideration.

After evaluating the majority prices for the effects of including the Btu content of the gas in the major portion analyses, 3 calculation methods were eliminated leaving calculation methods 1, 4, and 6 to be further evaluated.

Effect of Eliminating Below Spot Prices

Calculation method 4 uses all data without a valid NGPA category and a value greater than the monthly spot price. It was thought that values below market sensitive levels would represent price-regulated old gas, section 104, 105, and 106, which would have been sold at maximum lawful prices. Once these values were eliminated, the calculated majority prices would be representative of the values for gas sold under conditions influenced more by market forces and less by legal characteristics. As it turned out, this assumption was not totally correct due to the Commission's reporting requirements. The Commission required that a NGPA category be reported when the company was receiving a maximum lawful price which means that the lower price gas would have been put in the data sets with valid NGPA categories assuming the reporting requirements were followed. Therefore, it is conceivable that the prices lower than the spot which were eliminated were actually sold under market influenced rather than regulatory dictated conditions and should not have been eliminated. This probably accounts for the fact that

calculation method 4 used only 37 % of the volume that was used in calculation method 6.

The comparison of the majority prices for calculation methods 4 and 6 provided on Figure 3 shows the expected result of calculation method 6 resulting in consistently lower prices than calculation method 4 because all values below the spot price were removed from calculation method 4. The purpose for creating calculation method 4 was to give majority prices which were more sensitive to market pricing rather than regulatory pricing but as can be seen from the spot prices provided on Figure 4, the market established spot prices are consistently lower than calculation method 4 majority prices.

This evaluation eliminated calculation method 4 because of the low volumes used and because we had no assurance that data set created contained only prices which were derived from the market place rather than through legal mechanisms.

Calculation Method 1 Analysis

Because calculation method 1 most closely approximates the method required by the valuation regulations, extensive review was given to the majority prices calculated using the data set with valid NGPA categories and valid Btu contents. The only NGPA categories found in calculation method 1 were sections 102, 103, and 104, meaning that the other NGPA categories were not identified when reported to the Commission during the study's time frame. This may be because the reporting requirements of the Commission were to report a NGPA category only when the maximum lawful price (MLP) was received. It can be assumed that the value for the other categories of gas was being determined by market forces.

To determine some indication of the volume of gas that was utilized in calculation method 1, RVSD used gas purchase information obtained from the Department of Energy's Energy Information Agency (EIA). The EIA collects gas purchase information from all interstate pipeline companies on the Purchased Gas Adjustment report. EIA had earlier provided this information to RVSD in an unrelated project for the time period of 1984 through 1987. RVSD extracted

all of the fields containing Anadarko Area leases from the EIA data and compiled the volumes by NGPA category. These volumes were compared to the volumes used in calculation method 1 and can be found on Table 4. This Table show that for those categories that were reported to the Commission, the volumes were less than those reported to EIA as sold in interstate commerce, not even considering that the EIA data only includes purchases made through 1987. Table 4 also shows that over 30 % of the gas reported to EIA were for NGPA categories not reported to the Commission.

The RVSD also summed the volumes reported to the Commission by NGPA category for three sample months (Table 5). This demonstrate[5] that the volume of gas used in calculation method 1 greatly declined over time. This is consistent with the natural gas market throughout the late 1980's where more and more gas was being purchased through short-term contracts at a price reflective of market conditions rather than under long-term contracts at regulated prices.

Realizing that the very low volumes used in calculation method 1 might rule out the use of this method, RVSD attempted to determine if any individual field in the study had a percentage of gas by NGPA category that was greater than the percentage implied for the universe of fields. It was thought that some individual fields might have a large enough volume reported by NGPA category that calculation method 1 majority prices would be reasonable values for royalty purposes. Volumes used to compute majority prices for the higher cost, section 102 and 103 gas were totalled for every field that reported those NGPA categories. These volumes were compared to the total volume reported for the field, represented by calculation method 6 volumes. This comparison is provided on Table 6 and shows that the fields which have a high percentage of calculation method 1 volume also have very low volumes. Therefore, even selective use of calculation method 1 for those fields which use a representative percentage of the total volume would effect a very small percentage of the total gas produced from the Anadarko Area leases.

Though the calculation method 1 volume analysis indicated this method may have insufficient volumes to be considered representative, RVSD continued the evaluation of calculation method 1 by examining the calculated majority

prices.

The calculated majority prices for sections 102 and 103 gas were compared to the Oklahoma spot prices in Figures 5 and 6. These Figures show that the majority prices for section 102 gas began to mirror the spot price in mid-1987 and in mid-1986 for section 103 gas. Figure 6 also plotted the MLP for section 103 gas and shows that the majority price closely followed the MLP up until 1986 and then dropped down to the spot price levels. NGPA section 104 contains 9 different subcategories of gas with section 104A (Post 1974 gas) having the highest regulated price. Therefore, we plotted the section 104A majority prices against the MLP in Figure 7 which shows the two values follow the same trend. The majority prices for the other subcategories of section 104 gas also followed their respective MLP's.

Although the majority prices calculated for calculation method 1 appear to be reasonable, especially for NGPA categories 102 and 103 which are above spot market levels in the early years when more gas was being sold at regulated prices and then dropping down to spot levels as the natural gas market moved towards market level pricing, the volume of gas used to calculate these majority prices was very low and in the later years can almost be considered insignificant.

Calculation Method 6 Evaluation

During our previous evaluation, it was noted that calculation method 6 used all of the records and volume in a given field to calculate majority prices. Obviously, this calculation method used a volume representative of total field production so the only analysis needed is a review of the majority prices. The calculation method 6 majority prices were plotted against the spot market prices in Figure 8. From 1984 through mid-1987, the majority prices are consistently above the spot market price but follow the same general trend. This would be expected because during this time frame, a significant quantity of gas was still being sold under long-term contracts at regulated prices which were higher than market levels. From mid-1987 forward, the majority prices began to mirror the spot price which was a further reflection of the

natural gas market moving towards short-term market sensitive gas sales contracts.

Conclusions

After completing our review of the six different calculation methods, RVSD believes that calculation method 6 is the best estimator of a median value in a given field. The majority prices were shown to be reflective of the natural gas market during the time period of the study and the confidence level in using these prices is very high considering that 100 percent of the volume reported for each field was used the calculation. Calculation method 1 was found to calculate reasonable majority prices but used such a small percentage of the total volume, that the ability to substantiate and defend these values is very untenable.

The RVSD feels that the use of the majority prices determined in calculation method 6 as an indicia of the value upon which royalty is due is equitable to the Anadarko Area Allottees and to the royalty payors and should be adopted per the terms of the Kauley litigation Settlement Agreement.

Figure 1

MAJORITY PRICE COMPARISON

Calculation Methods 3 and 4

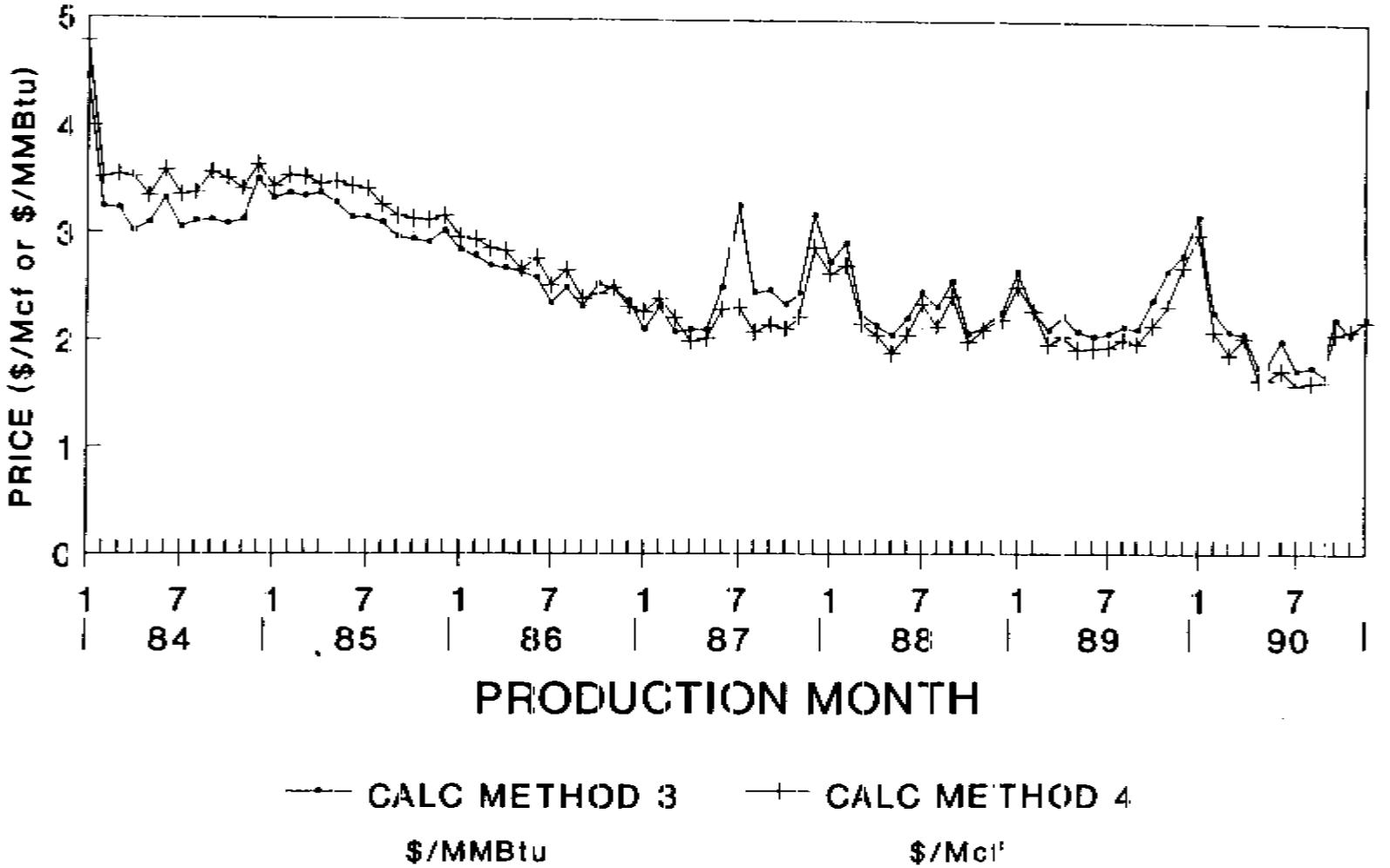

Figure 2

MAJORITY PRICE COMPARISON

Calculation Methods 5 and 6

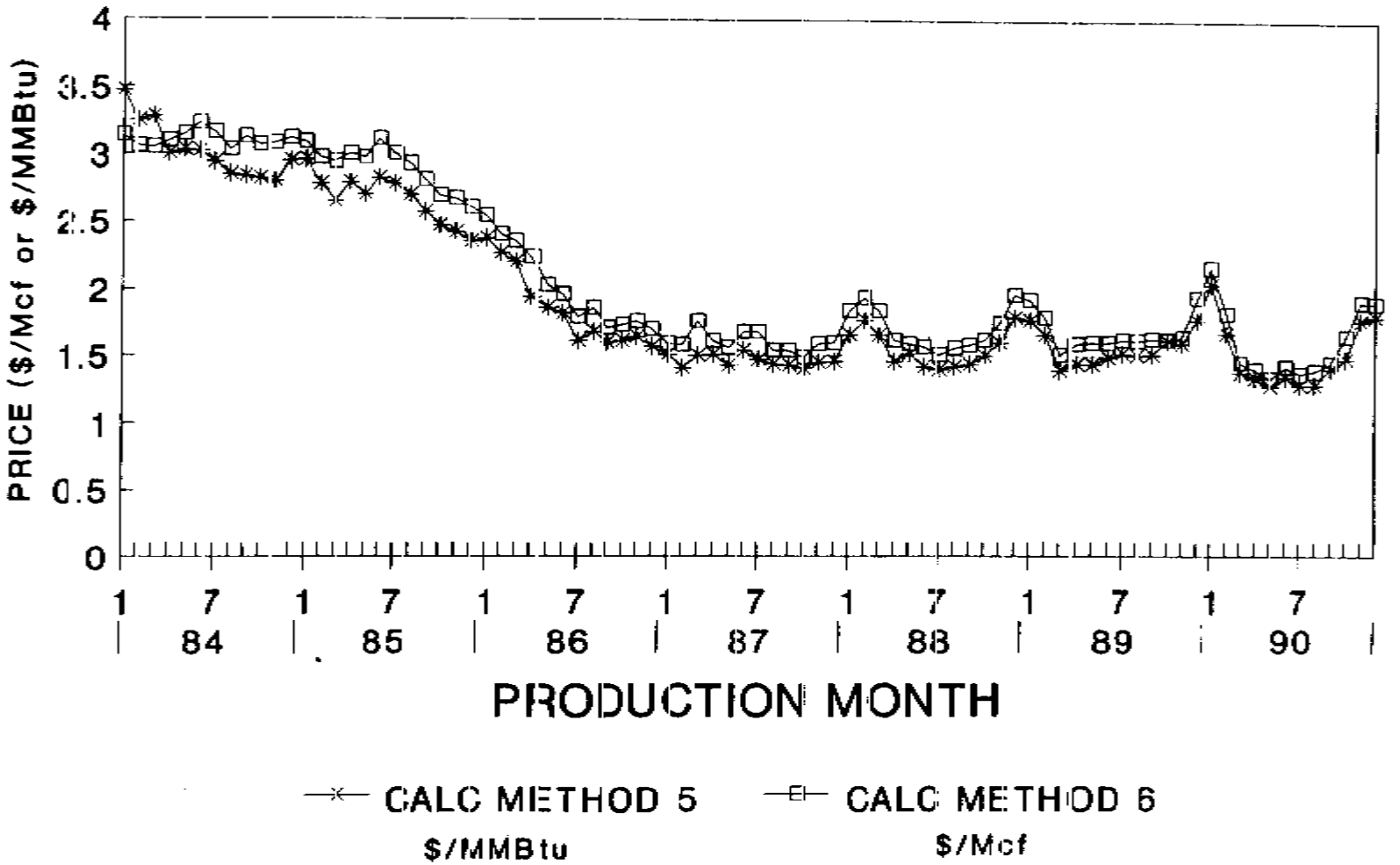

Figure 3

MAJORITY PRICE COMPARISON

Calculation Methods 4 and 6

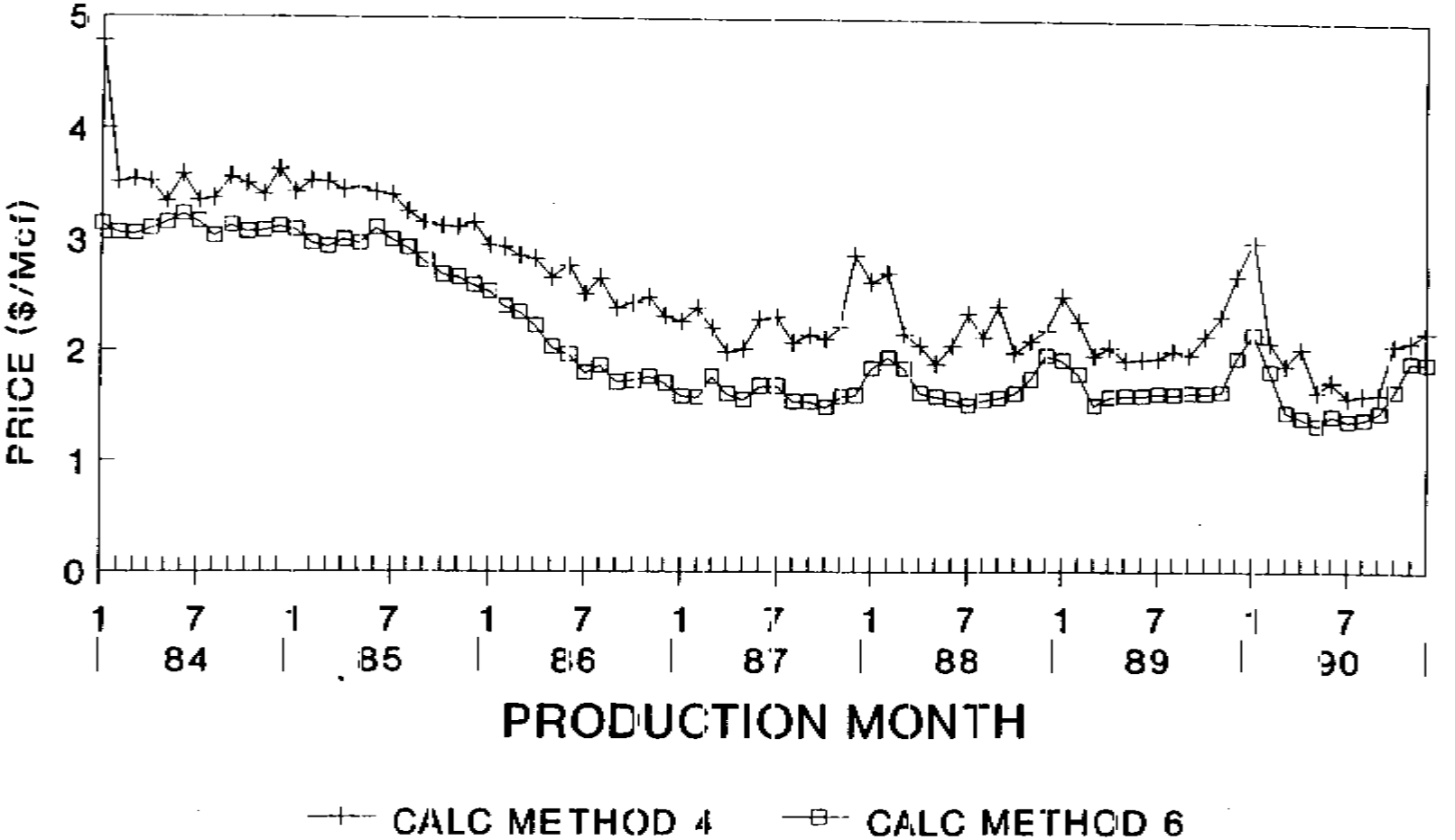

Figure 4

MAJORITY PRICE COMPARISON

Calculation Method 4 and Spot Price

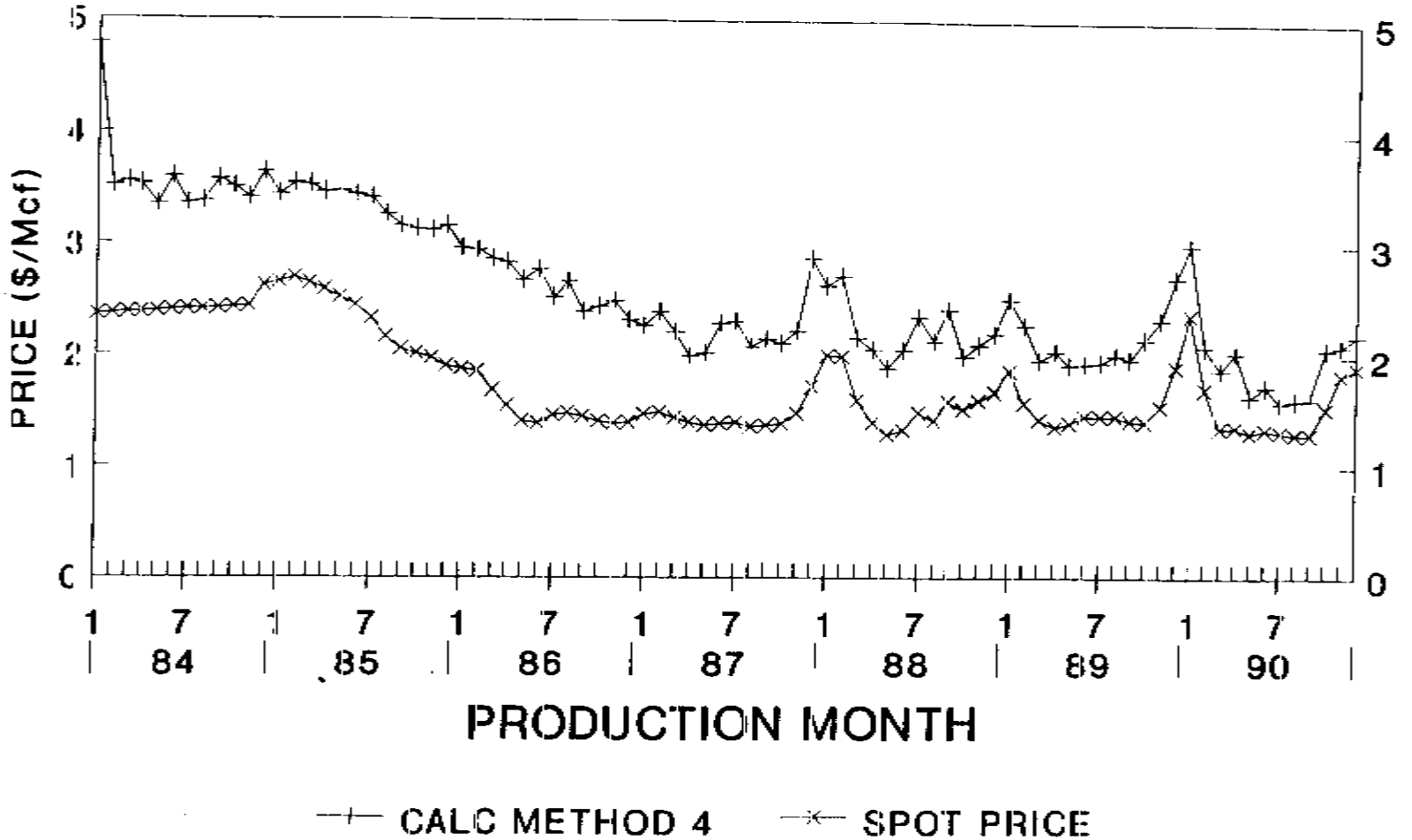

Figure 5

CALCULATION METHOD 1 COMPARISON

102 Majority Price and Spot Price

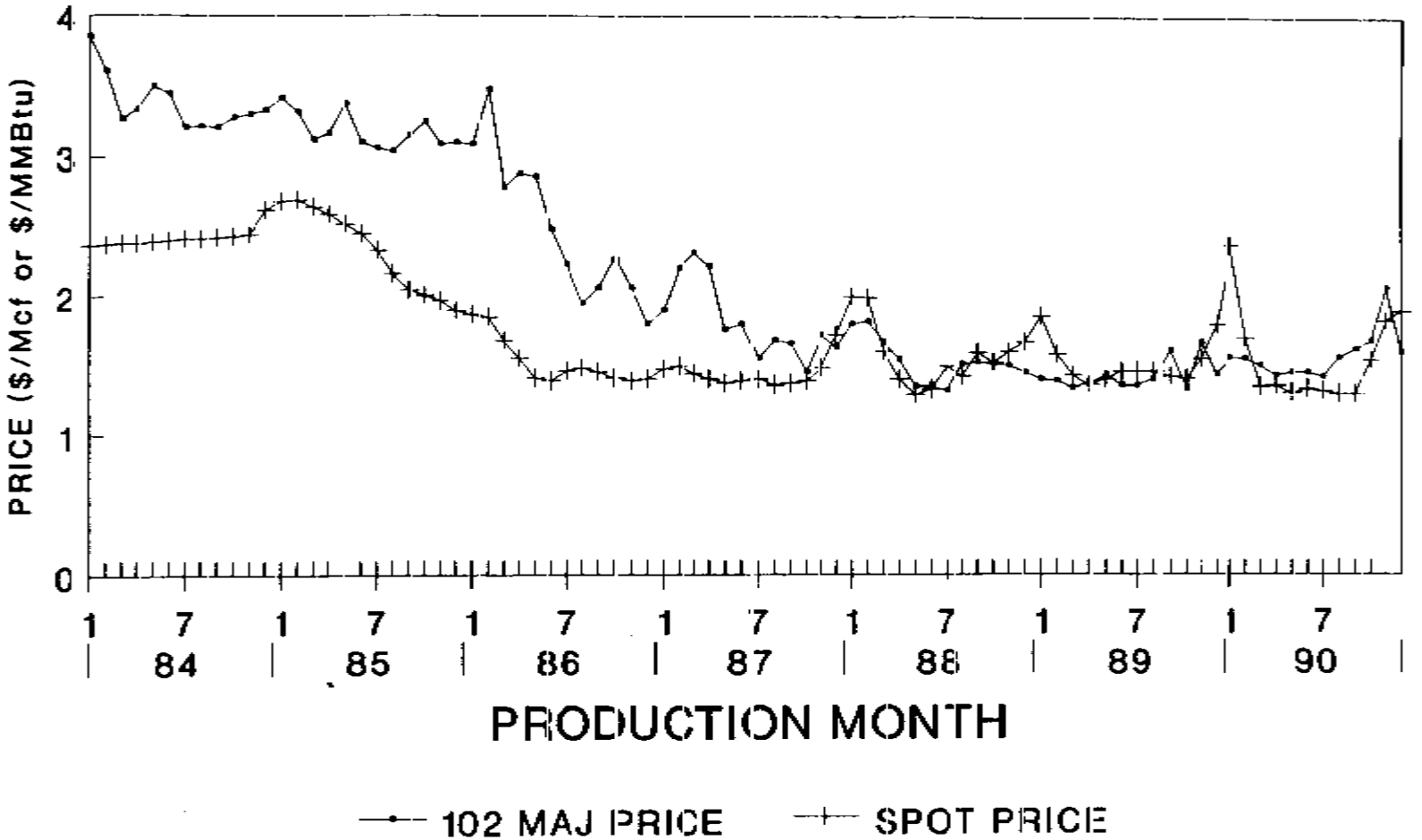

Figure 6

CALCULATION METHOD 1 COMPARISON

103 Maj. Price, 103 MLP, and Spot Price

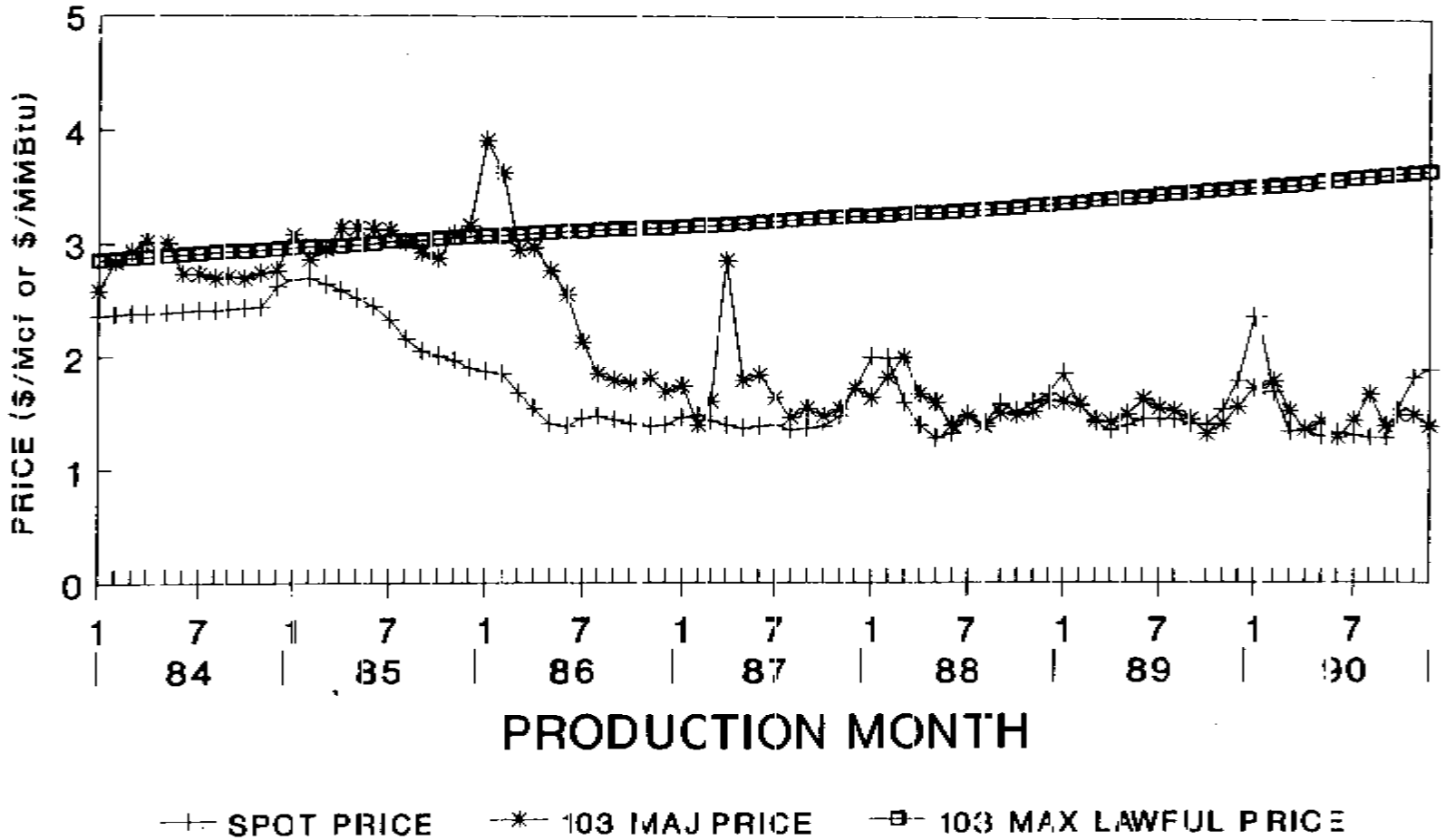

Figure 7

CALCULATION METHOD 1 COMPARISON

104A Majority Price and 104A MLP

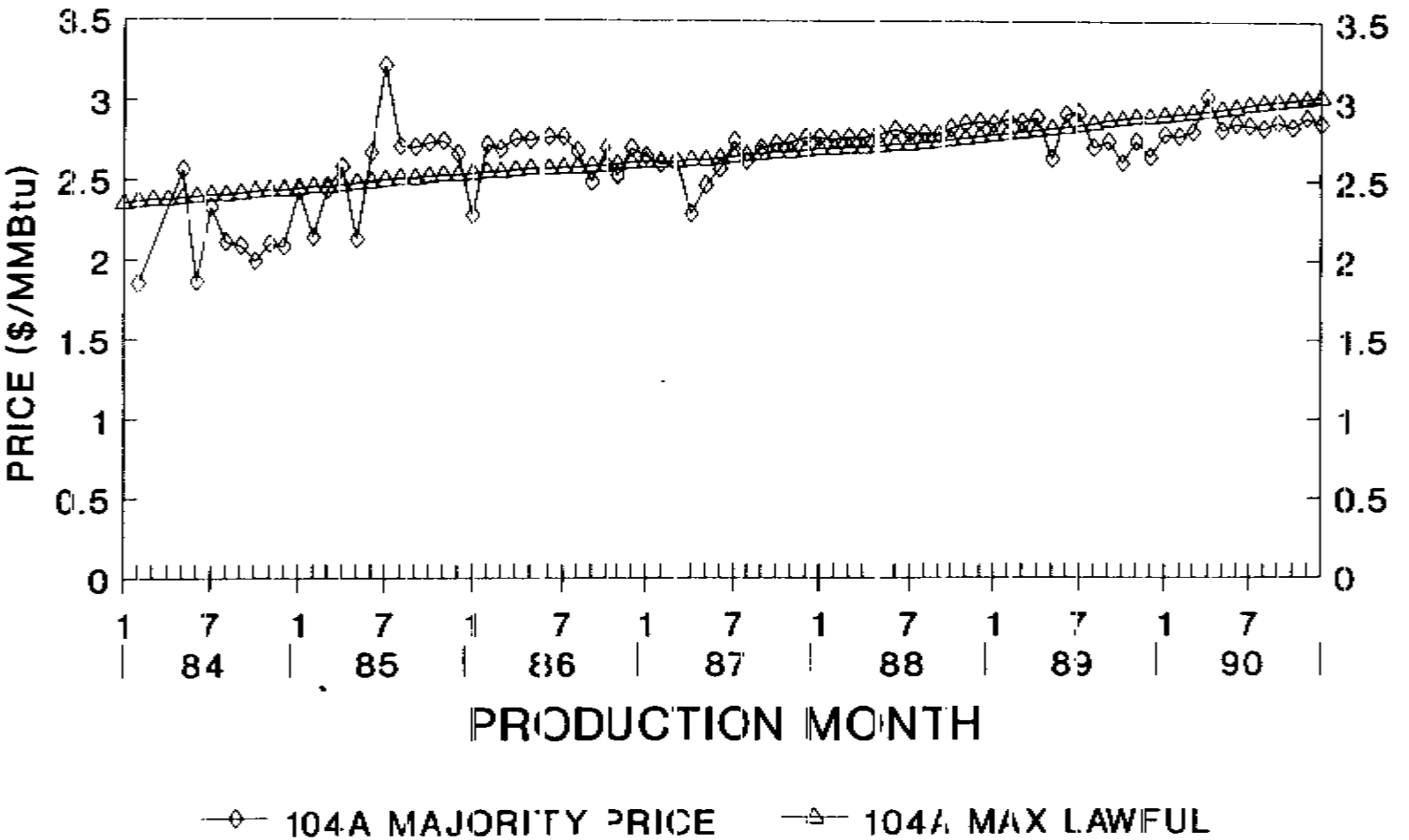

Figure 8

MAJORITY PRICE COMPARISON

Calculation Method 6 and Spot Price